

Amendments to the Claims:

Claims 4 to 6 are amended and claim 7 is added as set forth hereinafter.

Listing of Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Claims 1 to 3 (Cancelled).

4. (Currently Amended) A method for operating a sensor for determining the concentration of oxidizing gases in gas mixtures including and especially for determining the nitrogen oxide concentration in exhaust gases of an internal combustion engine, the sensor including: a first chamber disposed in a solid state electrolyte, the chamber being connected to the gas mixture via a first diffusion barrier; a second chamber arranged in the solid state electrolyte and said second chamber having a pregivable constant oxygen partial pressure; an oxygen pump electrode subjected to the exhaust gas on the solid state electrolyte; a further oxygen pump electrode and an NO pump electrode in said first chamber; and, an oxygen reference electrode arranged in said second chamber; the method comprising the steps of:

applying ~~a voltage~~ voltages (U\_IPE; U\_O2; U\_NO) to the pump electrodes, respectively, thereby generating respective pump currents; and evaluating a pump current

measuring one of said pump currents and outputting said one pump current as a measurement signal; and,

changing ~~the~~ said voltages (U\_IPE; U\_O2; U\_NO), which are applied to the pump electrodes, in dependence upon ~~the currents, which flow in the electrode feed lines and/or between the electrodes,~~ factors which correspond to the characteristic resistances or conductivities between said electrodes, during operation of the sensor in such a manner that the voltages correspond to ~~pregivable~~ predetermined desired values; ~~and,~~ ~~applying said voltages to the electrodes~~ values in the interior of said sensor.

5. (Currently Amended) The method of claim 4, wherein said voltages (U\_IPE; U\_O2; U\_NO) are ~~added to the voltages applied to the electrodes,~~ these added voltages corresponding changed by adding voltages thereto which correspond to a feedback of voltage components weighted with factors (K1, K2, K3, K4, K5, K6) which voltage components are proportional to ~~the currents, which flow in the electrode feed lines and/or between the electrodes during operation of the sensor and/or are proportional to the sliding mean values of the voltages, which are proportional to the currents and which are formed by means of electric circuit elements and/or the derivatives of higher order and/or their sliding mean values or linear combinations thereof~~ said factors.

6. (Currently Amended) The method of claim 4, wherein at least one of the factors (K1, K2, K3, K4, K5, K6) is increased so long until an oscillation of said sensor occurs because of the

feedback and that one slightly reduces this  
5 factor (K1, K2, K3, K4, K5, K6) by an amount determined  
experimentally so that just no oscillation occurs anymore.

7. (New) ~~The method of claim 4,~~ A method for operating a  
sensor for determining the concentration of oxidizing gases in  
gas mixtures and especially for determining the nitrogen oxide  
concentration in exhaust gases of an internal combustion engine,  
5 the sensor including: a first chamber disposed in a solid state  
electrolyte, the chamber being connected to the gas mixture via a  
first diffusion barrier; a second chamber arranged in the solid  
state electrolyte and said second chamber having a pregivable  
constant oxygen partial pressure; an oxygen pump electrode  
10 subjected to the exhaust gas on the solid state electrolyte; a  
further oxygen pump electrode and an NO pump electrode in said  
first chamber; and, an oxygen reference electrode arranged in  
said second chamber; the method comprising the steps of:

applying voltages (U\_IPE; U\_O2; U\_NO) to the pump  
15 electrodes, respectively, thereby generating respective pump  
currents;

measuring one of said pump currents and outputting said one  
pump current as a measurement signal;

changing said voltages (U\_IPE; U\_O2; U\_NO), which are  
20 applied to the pump electrodes, in dependence upon factors which  
correspond to the characteristic resistances or conductivities  
between said electrodes, during operation of the sensor in such a  
manner that the voltages correspond to predetermined desired  
values in the interior of said sensor; and,

25            wherein said voltages ( $U_{IPE}$ ;  $U_{O2}$ ;  $U_{NO}$ ) are changed by  
adding voltages thereto which correspond to a feedback of voltage  
components weighted with factors ( $K1$ ,  $K2$ ,  $K3$ ,  $K4$ ,  $K5$ ,  $K6$ ) which  
voltage components are proportional to the sliding mean values of  
the voltages, which are proportional to said factors and which  
30    are formed by means of electric circuit elements and/or the  
derivatives of higher order and/or their sliding mean values or  
linear combinations thereof.